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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/540,113 03/31/00 RENZ

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EXAMINER

MMC2/1107

SCHIFF HARDIN & WAITE
PATENT DEPARTMENT
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233 S. WACKER DRIVE
CHICAGO IL 60606-6473

ART UNIT	PAPER NUMBER
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2862

DATE MAILED:

11/07/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.
09/540,113

Applicant(s)

Renz et al.,

Examiner
Tiffany A. Fetzner

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– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Mar 31, 2000
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 35 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirements.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☒ All b) ☐ Some* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- *See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892) 18) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 19) ☐ Notice of Informal Patent Application (PTO-152)
- 17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 3 20) ☐ Other: _____

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DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

2. The disclosure is objected to because of the following informalities: On page 4 paragraph 3 line 4 after the first "coupled" insert "-in" so that the disclosure makes sense and matches the disclosure on page 6 paragraph 3 line 4.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim Rejections - 35 USC § 103

- 4.
5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. **Claims 1-13** are rejected under **35 U.S.C. 102(b)** as being anticipated by **McArthur** US patent 2,735,074 issued Feb. 14th 1956; or alternatively, **Claims 1-13** are rejected under **35 U.S.C. 103(a)** as being unpatentable over **McArthur** US patent 2,735,074 issued Feb. 14th 1956.

8. With respect to **Claim 1**, **McArthur** teaches a multi sector magnetic resonance device [See col. 6 line 52-57, Figure 6 interpreted broadly as a multi element MR antenna, because an MR application is suggested in col. 1 lines 62-66] **McArthur** suggests and shows “a plurality of antenna elements” (i.e. electrode segmental elements 41-46) , [See Figure 6] “each antenna having an element beginning” (i.e. interpreted as the radial inner ends of components 41-46) “and an element end” (i.e. interpreted as the radial outer ends of components 41-46)[See Figure 6]; said antenna elements being disposed radially relative to a center axis so as to proceed outwardly from the respective element beginnings to the respective element ends”; [See Figure 6] “said antenna elements (i.e. the segmented electrode elements} “being at least magnetically coupled with each other,” [See col. 6 lines 57 through col. 6 line 29]” and said plurality being at least five” [See Figure 6 where at least 6 segmented electrode antenna elements are shown].

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9. With respect to **Claim 2**, **McArthur** teaches connection to a ground potential in col. 6 lines 29-31, and from Figures 2, 3, and 9. Therefore it is inherent to the **McArthur** reference that “the respective element beginnings and the respective element ends are also connected to ground.” The same reasons for rejection, that apply to **claim 1** also apply to **claim 2**.

10. With respect to **Claim 3**, **McArthur** suggests that “said antenna elements are electrically coupled to each other.” [See col. 6 line 67 through col. 7 line 56.] The same reasons for rejection, that apply to **claim 1** also apply to **claim 3**.

11. With respect to **Claim 4**, **McArthur** teaches, shows, and suggests from the diagram of Figure 6,7 that “the respective element beginnings are electrically connected to each other via a ring-shaped connecting element.” [See Ring 51, inner conductor 54 in Figure 7, col. 6 line 67 through col. 7 line 56.] The same reasons for rejection, that apply to **claims 1, 3** also apply to **claim 4**.

12. With respect to **Claim 5**, **McArthur** teaches, shows, and suggests from the diagram of Figure 6,7 that “the respective element ends are electrically connected to each other via a ring-shaped connecting element.” [See Ring 48, outer conductor 56 in Figure 7, col. 6 line 67 through col. 7 line 56.] The same reasons for rejection, that apply to **claims 1, 3** also apply to **claim 5**.

13. With respect to **Claim 6**, **McArthur** teaches, shows, and suggests from the diagram of Figure 6,7 that “the respective element beginnings are electrically connected to each other via a first ring-shaped connecting element and wherein the respective element ends are electrically connected to each other via a second ring shaped connecting element. [See Figures 6, 7, col. 6

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line 67 through col. 7 line 56.] The same reasons for rejection, that apply to **claims 1, 3** also apply to **claim 6**.

14. With respect to **Claim 7**, **McArthur** shows, and suggests from the diagram of Figure 6, that “each of said antenna elements has two branching element ends.” [See Figure 6] The same reasons for rejection, that apply to **claim 1** also apply to **claim 7**.

15. With respect to **Claim 8**, **McArthur** shows, and suggests from the diagram of Figure 6, that “the respective element beginnings define an element beginning plane and wherein the respective element ends defines an element end plane, and wherein said element beginning plane and said element end plane are parallel to and spaced from each other.” [See Figure 6] The same reasons for rejection, that apply to **claim 1** also apply to **claim 8**.

16. With respect to **Claim 9**, **McArthur** shows, and suggests from the diagram of Figure 6, that “the respective antenna elements are linear.” [See Figure 6] The same reasons for rejection, sh that apply to **claims 1, 8** also apply to **claim 9**.

17. With respect to **Claim 10**, **McArthur** shows, and suggests from the diagram of Figure 6, that “the respective antenna elements define respective line directions, said line directions intersecting said center axis at a common point”, because if each of the linear radial ends were extended backward they would intersect at the center of ring 51. [See Figure 6, which suggests that all the segmented components have the same central axis point.] The same reasons for rejection, that apply to **claims 1, 8**, also apply to **claim 10**.

18. With respect to **Claim 11**, **McArthur** teaches, shows, and suggests from the diagram of Figure 6,7 that “a grounding plate disposed parallel to said element beginning plane and said

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element end plane, and said common point being disposed in said grounding plate.” [See col. 6 line 67 through col. 7 line 56; Figures 6, 7.] The same reasons for rejection, that apply to **claims 1, 8, 10** also apply to **claim 11**.

19. With respect to **Claim 12**, **McArthur** teaches, shows, and suggests “grounding plate disposed parallel to said element beginning plane and said element end plane.” [See col. 6 line 67 through col. 7 line 56; Figures 6, 7, 2, 3] The same reasons for rejection, that apply to **claims 1, 8**, also apply to **claim 12**.

20. With respect to **Claim 13**, **McArthur** teaches that any plurality of spaced electrodes (i.e. antenna segments) may be used. [See col. 6 line 57 -60; and Figure 6 which shows 6 segments, and claims 1-13] However, it is also well-know that four is an even number, and therefore the scope of invention taught by **McArthur** suggests “said plurality is divisible for four”, because all pluralities which are divisible by four are even pluralities inherently. The same reasons for rejection, that apply to **claim 1**, also apply to **claim 13**.

21. **Claims 1-13** are rejected under **35 U.S.C. 103(a)** as being unpatentable over **Oppelt et al.**, US patent 5,153,517 issued Oct. 6th 1992, in view of the established case law that Duplicating parts for a Multiplied Effect, is not a patentably distinguishing feature. St. Regis Paper Co. V. Bemis Co. Inc., 193 USPQ 8, 11 (7th cir. 1977); or alternatively in view of Figure 6 from **McArthur** US patent 2,735,074 issued Feb. 14th 1956.

22. With respect to **Claim 1**, **Oppelt et al.**, teaches “a multi element MR antenna” (i.e. a multi-element surface resonator is broadly interpreted as a type of multi element MR antenna, [See abstract and the entire reference in general.] col. 1 lines 62-66] **Oppelt et al.**, suggests and

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shows “a plurality of antenna elements” (i.e. electrode segmental elements 41-46) , [See Figures 2 through 8] “each antenna having an element beginning” (i.e. interpreted as the radial inner ends of components 17, 18 in Figures 4-6] “and an element end” (i.e. interpreted as the radial outer ends of components 17, 18 in Figures 4-6]; said antenna elements being disposed radially relative to a center axis so as to proceed outwardly from the respective element beginnings to the respective element ends”; [See Figures 4-6] “said antenna elements (i.e. components 17, 18 in Figures 4-6 elements} “being at least magnetically coupled with each other;” [See abstract, col. 5 line 6 through col. 6 line 10, and the entire reference in general. The examiner notes that coupling and decoupling is taught and suggested by the **Oppelt et al.**, reference throughout the reference.]”

23. **Oppelt et al.**, lacks teaching that the plurality of antenna elements is “at least five” However, it is known that the Duplicating of parts for a Multiplied Effect, is not a patentably distinguishing feature. [See *St. Regis Paper Co. V. Bemis Co. Inc.*, 193 USPQ 8, 11 (7th cir. 1977). The examiner notes that applicant’s invention merely increases the number of elements used in the invention of **Oppelt et al.**, with no other distinguishing feature. Since the surface resonator of **Oppelt et al.**, is designed for quadrature detection (i.e. detection based on four inputs, It would have been obvious to one of ordinary skill in the art, at the time that the invention was made that the invention of **Oppelt et al.**, could be modified to include 8, 12, 16, 20, 24 etc., antenna elements; because duplicating the number of antenna elements, while maintaining quadrature detection permits multiple locations to undergo quadrature detection at one time, which is a highly desirable advantage. The duplication of quadrature coils to take advantage of

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this is the established and well-known concept of phased-array quadrature detection. (I.e. Modifying **Oppelt et al.**, to include a plurality of quadrature surface resonators, suggests phased-array quadrature detection, a concept that the examiner takes official notice of as having been an established technique in the MR art for nearly a decade.) Additionally, Figure 6 of the **McArthur** reference suggests that the number of antenna elements is greater than 5, because **McArthur** shows six antenna elements.

24. The **McArthur** reference can be combined with the **Oppelt et al.**, reference because both references concern MR antennas. The examiner notes that the **McArthur** reference, uses older terminology because it is one of the first MR patents, but the technology and terminology from 1956 still is suggestive of an MR antenna configuration, therefore the invention of **McArthur** is analogous art.

25. With respect to **Claim 2**, **Oppelt et al.**, teaches connection to a ground potential in col. 4 lines 64-66 col. 5 line 32-col. 6 line 10, and from Figures 5 and 6]. The same reasons for rejection, obviousness, and motivation to combine that apply to **claim 1** also apply to **claim 2**.

26. With respect to **Claim 3**, **Oppelt et al.**, teaches and suggests that "said antenna elements are electrically coupled to each other." [See col. 4 line 50 through col. 5 line 31; Figure 4, abstract, and the entire reference in general.] The same reasons for rejection, obviousness, and motivation to combine, that apply to **claim 1** also apply to **claim 3**.

27. With respect to **Claim 4**, **Oppelt et al.**, teaches, and suggests that "the respective element beginnings are electrically connected to each other via a ring-shaped connecting element." [See Figure 7, col. 6 lines 11-56 especially lines 53-56; Figure 6, Figure 8] The same reasons for

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rejection, obviousness, and motivation to combine, that apply to **claims 1, 3** also apply to **claim 4**.

28. With respect to **Claim 5, Oppelt et al.**, teaches, shows, and suggests from the diagram of Figures 4, 5, and 6, that “the respective element ends are electrically connected to each other via a ring-shaped connecting element.” [See Figures 4, 5, 6] The same reasons for rejection, obviousness, and motivation to combine, that apply to **claims 1, 3** also apply to **claim 5**.

29. With respect to **Claim 6, Oppelt et al.**, shows, and suggests from the diagram of Figures 6, that “the respective element beginnings are electrically connected to each other via a first ring-shaped connecting element and wherein the respective element ends are electrically connected to each other via a second ring shaped connecting element. [See Figure 6] The same reasons for rejection, obviousness, and motivation to combine, that apply to **claims 1, 3** also apply to **claim 6**.

30. With respect to **Claim 7, Oppelt et al.**, shows, and suggests from the diagram of Figure 4, that “each of said antenna elements has two branching element ends.” [See Figure 4] The same reasons for rejection, that apply to **claim 1** also apply to **claim 7**.

31. With respect to **Claim 8, Oppelt et al.**, teaches, shows, and suggests from the diagram of Figure 4, that “the respective element beginnings define an element beginning plane and wherein the respective element ends defines an element end plane, and wherein said element beginning plane and said element end plane are parallel to and spaced from each other.” [See Figure 4; col. 2 line 56 through col.3 line 25; col. 4 line 50 through col. 5 line 31; and the entire reference in

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general.] The same reasons for rejection, obviousness, and motivation to combine, that apply to **claim 1** also apply to **claim 8**.

32. With respect to **Claim 9**, **Oppelt et al.**, shows, and suggests from the diagram of Figures 4 through 10 “the respective antenna elements are linear.” [See Figures 4 through 10] The same reasons for rejection, obviousness, and motivation to combine, that apply to **claims 1, 8** also apply to **claim 9**.

33. With respect to **Claim 10**, **Oppelt et al.**, shows, and suggests from the diagram of Figures 4, 5, 6, and 7 that “the respective antenna elements define respective line directions, said line directions intersecting said center axis at a common point”, [See Figures 4, 5, 6, and 7 which suggests that all the segmented components have the same central axis point.] The same reasons for rejection, obviousness, and motivation to combine, that apply to **claims 1, 8**, also apply to **claim 10**.

34. With respect to **Claim 11**, **Oppelt et al.**, teaches, and suggests from the diagram of Figure 5 that “a grounding plate disposed parallel to said element beginning plane and said element end plane, and said common point being disposed in said grounding plate.” [See Figures 8, 9, where component 68 is drawn suggestively as a plane or plate, and col. 7 lines 3-45 specifically lines 9-25; which suggest that component 68 is connected to ground or grounded, therefore the plane or plate illustrated in Figures 8, 9 is interpreted as a grounding plate or grounding plane.] The same reasons for rejection, obviousness, and motivation to combine, that apply to **claims 1, 8, 10** also apply to **claim 11**.

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35. With respect to **Claim 12, Oppelt et al.**, suggests “grounding plate disposed parallel to said element beginning plane and said element end plane.” [See col. 7 lines 3-45, Figures, 8, 9] The same reasons for rejection, obviousness, and motivation to combine, that apply to **claims 1, 8**, also apply to **claim 12**.

36. With respect to **Claim 13, Oppelt et al.**, suggests that the “plurality is divisible for four”, because **Oppelt et al.**, shows a plurality of four “quadrature” antenna elements and as mentioned in the rejection of **claim 1**, and modifying **Oppelt et al.**, to include a plurality of quadrature surface resonators, suggests phased-array quadrature detection, a concept which as noted in the rejection of **claim 1**, has been an established technique in the MR art for nearly a decade. The same reasons for rejection, obviousness, and motivation to combine, that apply to **claim 1**, also apply to **claim 13**.

37. Prior Art of Record

38. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- A) **R.L. Barrish et al.**, US patent 2,281,404 issued April 28th 1942.
- B) **Edelstein** US patent 4,620,155 issued October 28th 1986.
- C) **Pissanetzky et al.**, US patent 5,659,281 issued August 19th 1997. [See Figures 3a, 3b].
- D) **Prammer et al.**, US patent 6,268,726 issued July 31st 2001, filed January 15th 1999. [See Figures 4, 22a, 22b, 25, 26].

Conclusion

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39. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tiffany Fetzner whose telephone number is (703) 305-0430. The examiner can normally be reached on Monday-Thursday from 7:00am to 4:30pm., and on alternate Friday's from 7:00am to 3:30pm.

40. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams, can be reached on (703) 305-4705. The fax phone number for the organization where this application or proceeding is assigned is (703)305-3432 .

41. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-0956.

Tiffany A. Fetzner

TAF

November 2, 2001

Hezron Williams
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